

USSR

Powder Metallurgy

UDC 621.762.669. 18.95

PALATNIK, L. S., KAGAN, YA. I., SHILOV, I. F., BELYAYEV, YU. I., BOGDANOVA, A. F., KOBYLEV, P. P., KOLESNIK, B. I., and KUDINOV, D. D., Khar'kov Polytechnic Institute imeni V. I. Lenin

"On the Micro- and Macroheterogeneity of the SAS-1 Alloy"

Kiev, Poroshkovaya Metallurgiya, No 4, Apr 73, pp 22-28

Abstract: A study was made of the physical and chemical heterogeneity of the SAS-1 aluminum sintered alloy. The luminescence method of flaw detection using metallography was employed in the investigation of the physical heterogeneity of the alloy. The nature, dimensions and statistical distribution of pores appearing in the alloy in the process of its production and subsequent treatment were determined. The parameters of the luminescence method were corrected for the purpose of obtaining maximum sensitivity during the investigation of alloy microporosity. It was shown that with selected optimal conditions local pores with dimensions $10 \times 15 \times 25 \mu m$ can be reliably detected. The problems of the appearance of chemical heterogeneity of the alloy in micro- and macrovolumes were considered. Assumptions are advanced whose realization will result in a decreased number of macro- and micro-flaws in the SAS-1 alloy.

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1/2 026
TITLE--POLYMERIZATION OF CYCLOSILOXANES BY BASES IN THE PRESENCE OF
ACTIVATORS -U- PROCESSING DATE--18SEP70
AUTHOR-(03)-YUZHLEVSKIY, YU.A., KAGAN, YE.G., FEDOSEYEVA, N.N.
COUNTRY OF INFO--USSR
SOURCE--DOKL. AKAD. NAUK SSSR 1970, 190(3), 647-50 (CHEM TECHNOL)
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--POLYMERIZATION RATE, CYCLIC GROUP, SILOXANE, FLUORINATED
ORGANIC COMPOUND, ETHER, DIOXANE, NITROBENZENE, HETEROCYCLIC
OXYGEN COMPOUND, CHEMICAL REACTION MECHANISM
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--1984/1577 STEP NO--UR/0020/70/190/003/0641/0650
CIRC ACCESSION NO--A10100195
UNCLASSIFIED

2/2 026

UNCLASSIFIED

PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AT0100195

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. IN THE ABSENCE OF ACTIVATORS THE POLYMN. OF 1,3,5-TRIMETHYL-1,3,5-TRIS(3,3,3-TRIFLUOROPROPYL) CYCLOTETRASILOXANE IS FIRST ORDER IN MONOMER AND 0.5 ORDER WITH RESPECT TO THE CATALYST (NA SILOXANEDIOLATE, I). IN THE PRESENCE OF APROTIC ACTIVATORS AND 0.002M I THE RELATIVE REACTION RATES (K-K SUB0) INCREASE (ACTIVATOR, ACTIVATOR CONC. (M), POLYMN. TEMP., AND K-K SUB0 GIVEN): BU SUB2 O, 0.1, 110DEGREES, 1.2; P-DIOXANE, 0.1, 110DEGREES, 1.2; PHNO SUB2, 0.1, 40DEGREES, 2.1; ET SUB3 N, 0.1, 110DEGREES, 2.5; TETRAHYDROPYRAN, 0.1, 40DEGREES, 5.1; TETRAHYDROFURAN, 0.1, 40DEGREES, 10.5; MECN, 0.1, 40DEGREES, 34.0; BETA-CYANOETHYLHEPTAMETHYLCYCLOTETRASILOXANE, 0.1, 40DEGREES, 35.0; ET SUB2 CO, 0.1, 40DEGREES, 80; ME SUB2 CO, 0.1, 40DEGREES, 95; ETCOME, 0.1, 40DEGREES, 100; MECOPR, 0.1, 40DEGREES, 106; HCONME, 0.01, 30DEGREES, 150; ME SUB2 SO, 0.01, 30DEGREES, 155; BU SUB3 PO SUB4, 0.01, 40DEGREES, 300; MEOCH SUB2 CH SUB2 OME, 0.001, 30DEGREES, 4.0; (ETO CH SUB2 CH SUB2) SUB2 O, 0.001, 30DEGREES, 14.0; (MEOCH SUB2 CH SUB2) SUB2 O, 0.001, 30DEGREES, 28.0; PO(NME SUB2) SUB3, 0.001, 30DEGREES, 28.0. IN THE PRESENCE OF ACTIVATORS THE POLYMN. IS FIRST ORDER WITH RESPECT TO I AT CONST. (ACTIVATOR)-(I) RATIO. AT CONST. ACTIVATOR CONC., THE RATE CONST. PASSES THROUGH A MAX. WITH INCREASING (I). A MECHANISM IS PROPOSED.

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009
UNCLASSIFIED
TITLE--HOMOGENEOUS CATALYTIC HYDROSILYLATION IN THE PRESENCE OF PLATINUM
STYRENE COMPLEXES -U-
AUTHOR--(03)--REYKHSFELD, V.O., ASTRAKHANOV, M.I., KAGAN, YE.G.
PROCESSING DATE--30OCT70
COUNTRY OF INFO--USSR
SOURCE--ZH. OBSHCH. KHIM. 1970, 40(3), 699
DATE PUBLISHED--70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--PLATINUM COMPLEX, ORGANOSILICON COMPOUND, STYRENE, CHLORINE,
METHYLENE
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--2000/0883
STEP NO--UR/0079/70/040/003/0699/0699
CIRC ACCESSION NO--AP0124546
UNCLASSIFIED

2/2 009

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0124546

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. REACTION OF $\text{PHCH}=\text{CH}$ SUB2 AND ITS P,CL , P,G SUB2 N, P,ME , $2,4,\text{ME}$ SUB2, OR P,MEO DERIVS. IN THE FORM OF PT COMPLEXES OF TYPE (ZPTCL SUB2) SUB2 WITH MESIHCL SUB2 IN PHSICL SUB3 AS SOLVENT WAS STUDIED. THE PRESENCE OF ANY SUBSTITUENT IN THE STYRENE COMPONENT INCREASED THE RATE OF REACTION IN THE ORDER H , P,CL , $2,4,\text{ME}$ SUB2, P,ME , P,MEO IN THE SERIES OF LIGANDS. THE RATE OF HYDROSILYLATION CAN BE RELATED TO HAMMET CONSTS. OF THESE SUBSTITUENTS BY A U SHAPED CURVE WITH A MIN. AT THE STYRENE COMPLEX. THE INCREASE OF REACTION RATE OF $\text{PHCH}=\text{CH}$ SUB2 WITH MESIHCL SUB2 WITH INCREASING STABILITY OF THE PT COMPLEX WITH THE INDICATED OLEFINS IS AN ARGUMENT IN FAVOR OF THIS REACTION TAKING A HOMOGENEOUS CATALYTIC ROUTE ON PT CATALYSTS IN WHICH A PT OLEFIN COMPLEX ACTS AS THE INTERMEDIATE.

UNCLASSIFIED

USSR

UDC 669.14.018.8:620.18

ZASLAVSKAYA, L. V., LASHKO, N. F., BELYAKOV, L. N.,
ANDREYEVA, F. S., and KAGAN, Ye. S., All-Union Scientific
Research Institute of Aviation Materials

"Redistribution of Nickel and Chromium in $\alpha \rightarrow \gamma$ -Transformation
in Stainless Steels Containing Chromium and Nickel"

Moscow, Metallovedeniye i Termicheskaya Obrabotka Metallov, No 2, 1973,
pp 39-42

Abstract: A study was made of Cr, Ni, and Mo redistribution
when tempering in the interval of partial $\alpha \rightarrow \gamma$ -transformation
in Kh11N9 and Kh11N9M2 stainless steels, containing nickel and
chromium and serving as base of martensitic aging stainless
steels. The Kh11N9 steel contained 0.012% C, 0.022% Mn,
0.07% Si, 0.68% Cr, and 9.2% Ni; the Kh11N9M2 steel was ad-
ditionally alloyed with 1.9% Mo. At heating rates ≤ 50 deg/sec,
 $\alpha \rightarrow \gamma$ -transformation goes with Cr and Ni redistribution between
 α - and γ -phases. At partial $\alpha \rightarrow \gamma$ -transformation, austenite con-

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ZASLAVKAYA, L. V., et al., Metallovedeniye i Termicheskaya Obrabotka Metallov, No 2, 1973, pp 39-42

tains more Cr, Ni, and probably also more Mo than the α -phase. The austenite concentration with Cr, Ni, and with other elements in the $\alpha \rightarrow \gamma$ -transformation process in Kh11N9-type steels is apparently one of the sources of austenite stabilization of these steels in the tempering process at $\alpha \rightarrow \gamma$ -transformation temperature. Two figures, one table, twelve bibliographic references.

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Steels

USSR

UDC 669.15'24'26:002.25:531.3

ARAPOVA, L. V., RYZHAK, S. S., and KAGAN, Ye. S.

"Aging Kinetics of Nickel and Chromium-Nickel Alloys Containing Aging-Prone Martensite"

Moscow, Metallovedeniye i Termicheskaya Obrabotka Metallov, No 10, 1972, pp 10-15

Abstract: The aging kinetics of two low-carbon ($\leq 0.03\%$ C) steels, N18K9M5T and Kh11N10M2T, was studied. Hardness (Δ HRC), electrical resistance (ρ), and coercive force (H_c) were determined during the aging tests, which were carried out at 400-500°C. A heating of both steels at 480°C for 15 sec sharply increased hardness and decreased ρ and H_c . Both steels were characterized by a rapid hardening in the process of maximal aging. The lower the aging temperature, the greater the hardness. But it took a longer time to reach maximal hardness. The coercive force decreased with the increase of the heating time during aging at 400 and 425°C. However, at 475 and 500°C it decreased at first, then it increased sharply. Cold working did not intensify the aging process but the coercive force increased sharply. The electrical resistance decreased for both steels with increased hardness, but when the hardness reached its peak the electrical resistance remained unchanged. The

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ARAPOVA, L. V., et al., Metallovedeniye i Termicheskaya Obrabotka Metallov, No 10, 1972, pp 10-15

coercive force changes during aging of these steel at 400-500°C for 100 hr did not reflect the aging process. Addition of 0.8% Ti to a Fe-Ni-Ti alloy increased its hardness to ΔHRC 18 but the addition of 0.9% Ti to Kh11Ni10M2 resulted in ΔHV_{10} 150 because Ti in this alloy was the only element which caused the aging. After addition of 0.8% Ti to Fe18Ni15Mo the $\Delta HRC = 8$ at maximum aging, but when the same amount of Ti was added to an alloy containing Co and Mo the hardening effect of Ti was $HRC = 4-5$.

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USSR

UDC 669.14.018.298:620.172

KAGAN, YE. S., SMIRNOV, B. S., and FRIDMAN, V. S.

"Ductility and Plasticity Increase of 000Kh11N10M2T Steel in Large Cross-Sections"

Moscow, Metallovedeniye i Termicheskaya Obrabotka Metallov, No 12, 1973, pp 13-17

Abstract: The influence of different methods of heat treatment and of hot plastic deformation on the ductility, plasticity, and also on the state of the surface of fractures of 000Kh11N10M2T steel was experimentally determined. Hot-rolled rings, after water-hardening from 1200°C, rolling at 1050°C, hardening from 860°C, and aging at 500-525°C were found to possess tangentially high and axially satisfactory elasticity and ductility. Rings which were not preliminarily hardened from 1200°C differed little in plasticity and ductility from rings subjected to high-temperature hardening. Heat treatment (600°C for 2 hr or 600°C for 5 hr + 500°C for 2 hr) of hot-rolled rings for the ultimate strength $\sigma = 120-130 \text{ kg/mm}^2$ raised ductility and plasticity of hot-rolled rings. The possibility was ascertained to increase the ductility and plasticity of 000Kh11N10M2T steel by heat treatment for $\sigma = 135-150 \text{ kg/mm}^2$, including aging at 600°C, hardening from 860°C, and aging at 500°C. Two figures, two tables, four bibliographic references.

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UDC 669.14.018.258.8:669-973

KAGAN, YE. S., POTAK, YA. M., SACHKOV, V. V., KOZLOVSKAYA, V. I.,
GRUKOV, G. M., All-Union Scientific Research Institute of
Aviation Materials

"Stainless Steel of Increased Strength for Cryogenic Temperatures"

Moscow, Metallovedeniye, No 10, 1971, pp 18-20

Abstract: The mechanical properties of the 000Kh11N10M2T (EP678) hardened steel and its welded joints were experimentally investigated at temperatures up to -253°C . Standard steel specimens and specimens with cracks showed a high ductility and low notch sensitivity. With regard to mechanical properties, the investigated steel at -253°C is not inferior to the widely used 30KhGSMA steel at 20°C . The relatively slow cooling in soldering from 980 to 700°C has little effect on the steel plasticity, due to the negligible change of solubility of carbides in this temperature interval. Welded steel joints, without and with additives, possess high plasticity and show a completely ductile fracture from tangential stresses in tests up to -253°C . 000Kh11N10M2T steel is a promising material for cryogenic technology due to its

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KAGAN, YE. S., et al, Metallovedeniye, No 10, 1971, pp 18-20
high yield point ($\sim 90 \text{ kg/mm}^2$) at 20°C and its applicability up
to -253°C . 2 illustrations, 1 table, 5 bibliographic references

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USSR

UDC: None

GOL'DANSKIY, V. I., KAGAN, Yu., and NAMIOT, V. A.

"Two-Stage Excitation of Nuclei to Obtain Stimulated Emission of Gamma Quanta"

Moscow, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, vol 18, No 1, 5 July 1973, pp 61-63

Abstract: This letter is based, at least in part, on earlier articles by the first two authors named above (ZhETF, 64, 1973, p 90; a report presented at the scientific sessions "Otdeleniye obshchey fiziki i astronomii" and "Otdeleniye yadernoy fiziki" -- Division of General Physics and Astronomy and Division of Nuclear Physics -- of the USSR Academy of Sciences, 28 December 1972, UFN, 110, 1973, p 445) in which the possibility of creating a laser for nuclear gamma transitions (a gaser) was analyzed. In those articles, it was concluded that pulse pumping of the Mössbauer levels by the capture of neutrons is necessary. In the present letter, the authors report a two-stage method of reducing the intensity of the neutron beam required to provide the specified density of excited nuclei. In the first stage, the neutrons are captured in a target with a Mössbauer-level population having a mass number close to 1/2

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USSR

UDC: None

GOL'DANSKIY, V. I., et al, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, vol 18, No 1, 5 July 1973, pp 61-63

that of the nucleus. In the second stage, the radiated gamma quanta are captured by the nuclei in a second target. The targets in both stages are solids.

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UDC 537.311/.312

KAGAN, Yu., Corresponding Member of the USSR Academy of Sciences, and FLEROV, V. N.

"Lower-Temperature Behavior of the Resistance of a Pure Metal"

Moscow, Doklady Akademii Nauk SSSR, Vol 203, No 4, 1972, pp 787-790

Abstract: The problem of low-temperature behavior of the resistance of an ideally pure metal has been incompletely studied, especially with regard to the situation with a complex Fermi surface in which the Fermi surface intersects the Brillouin zone boundary, closed or forming an open surface. Direct use of the classical arguments of Peierls is difficult in this case, and the problem of drag and the behavior of the resistance at low temperatures has remained open. In the present article a general analysis is made which permits a joint investigation of all possible cases. A study was made of an infinite crystal without impurities, but only the electron-phonon and phonon-phonon interactions were considered. Only the variation principle following directly from the quasiclassical Boltzman equation and the general properties of the electron distribution function $f(p, n)$ such as continuity and periodicity in a reciprocal lattice space were used. Open and closed Fermi surfaces are considered separately under the implicit assumption of cubic symmetry, and then the analysis is extended to the general case. Physical explanations are offered for the theoretical results.

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USSR

BROWMAN, Ye. G.; KAGAN, Yu.; HOLAS, A. (Kurchatov Institute of Atomic Energy)

"Properties of Metallic Hydrogen under Pressure"

Moscow, Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki; April 1972,
pp 1492-1501

Abstract: The properties of the metallic phase of hydrogen under pressure are investigated. (A detailed analysis of metallic hydrogen at zero pressure has been presented in a previous paper [Ye. G. Browman, Yu. Kagan, A. Holas; ZhETF, 61, 2429, 1971]. The static lattice energy and zero point vibrations energy as functions of pressure are considered for a number of concurrent phases. The respective equations of state and thermodynamic potential of the metallic phase are found. This permits one to determine the pressure of transition from the molecular to metallic phase. Various phase transitions which may occur in metallic hydrogen are studied, and it is found that the structure of hydrogen under pressure has tendencies which are peculiar to the liquid phase.

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USSR

KAGAN, YU.

"Bound Neutron in a Substance"

Moscow, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki,
Vol 11, No 4, 20 Feb 70, pp 235-239

Abstract: The article presents an analysis demonstrating the possibility of the existence of a long-lived bound neutron state in a substance. The impetus for the analysis was provided by an article by T. J. GRANT and J. W. COBBLE reporting the experimental detection of neutrons escaping with a delay of the order of tens of seconds (after cessation of neutron exposure) from a preirradiated crystal of LiF at the temperature of helium. The lifetime of the "bound" neutron in the crystal, the bound state of the neutron in the crystal, the trapping and absorption of neutrons are considered. The author thanks A. I. AFANAS'YEV, YA. A. SMORODINSKIY, and especially V. M. GALITSKIY for useful discussions.

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Acc. Nr: AP0038044 **K**

Ref. Code: UR 0056

PRIMARY SOURCE: Zhurnal Eksperimental'noy i Teoreticheskoy
Fiziki, 1970, Vol 58, Nr 1, pp 226-244

THEORY OF CHANNELING EFFECTS. I

Yu. Kagan, Yu. V. Kononets

A consistent method for analysis of channeling and related effects is developed which is based on the density matrix formalism and permits one to single out in a consistent manner coherent diffraction due to regularity of the medium. In the case of plane channeling and neglect of inelastic scattering the problem reduces to that of motion of a particle in a one-dimensional periodic potential $V_{eff}(x)$ which depends on the crystal temperature. States whose energies are close to the maximal values of $V_{eff}(x)$ are found to play an important role. The distance from the input surface, over which significant change of the nuclear reaction yield occurs, is studied. It is shown that spikes of the nuclear reaction yield appearing with increase of the crystal thickness (resembling an «echo») may appear. A concrete analysis is carried out for a model potential of the Kronig—Penney type. The calculations yield all the qualitative results and in particular demonstrate the quantum oscillations of the nuclear reaction yield averaged over the thickness as a function of the angle of incidence.

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KAGAN, Yu.; BROVMAN, Ye. G.; KHOLAS, A.

"Properties of Alkali Metals"

Leningrad, Solid State Physics; April, 1970; pp 1001-13

ABSTRACT: By means of a two-parametric, pseudo potential a number of properties of the alkali metals sodium and potassium were studied: binding energy, moduli of elasticity, their derivatives, equation of state, phonon spectrum, etc. Good agreement with experimental data was observed in all cases.

The article includes 21 equations, 7 figures, and 5 tables. There are 31 bibliographic references.

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1/2 018 UNCLASSIFIED PROCESSING DATE--09OCT70
TITLE--INTERFERENCE OF NUCLEAR RESONANCE ELECTRON PRODUCTION AND
PHOTOEFFECT FOR MOESSBAUER E2 AND M1 GAMMA RAYS -U-
AUTHOR-(02)-AFANASEV, A.M., KAGAN, YU.

COUNTRY OF INFO--USSR

SOURCE--PHYS. LETT.; 31A: 38-9(JAN. 12, 1970)

DATE PUBLISHED--12JAN70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--MOSSBAUER SPECTRUM, PHOTO NUCLEAR REACTION, NUCLEAR RESONANCE,
PHOTOELECTRON, ELECTRON SPECTRUM, ANGULAR DISTRIBUTION, INTERFERENCE
MEASUREMENT, GAMMA RAY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1982/0661

STEP NO--NE/0000/70/031/000/0038/0039

CIRC ACCESSION NO--AP0052121

2/2 018

UNCLASSIFIED

PROCESSING DATE--09OCT70

CIRC ACCESSION NO--AP0002121

ABSTRACT/EXTRACT--(U) GP-C- ABSTRACT. IT IS SHOWN THAT THIS TYPE OF INTERFERENCE CAN DISPLAY ITSELF FOR E2 AND M1 NUCLEAR TRANSITIONS IF ONE STUDIES THE ANGULAR DISTRIBUTION OF THE ELECTRON PRODUCED BY THE GAMMA RAYS RATHER THAN THE TOTAL ABSORPTION. FACILITY: KURCHATOV INST. OF ATOMIC ENERGY, MOSCOW.

UNCLASSIFIED

1/2 023 UNCLASSIFIED PROCESSING DATE--16OCT70
TITLE--INTERFERENCE OF NUCLEAR RESONANCE ELECTRON PRODUCTION AND
PHOTOEFFECT FOR MOSSBAUER E2 AND M1 GAMMA RAYS -U-
AUTHOR-(02)-AFANASEV, A.M., KAGAN, YU. *K*

COUNTRY OF INFO--USSR

SOURCE--PHYS. LETTERS (NETHERLANDS), VOL. 30A, NO. 1, P. 38-9, 12 JAN,
1970
DATE PUBLISHED--12JAN70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--PHOTONUCLEAR REACTION, MOSSBAUER EFFECT, TRANSITION RADIATION,
ELECTRON SPECTRUM, ANGULAR DISTRIBUTION, INTERFERENCE MEASUREMENT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1986/0122

STEP NO--NE/0000/70/030/001/0038/0039

CIRC ACCESSION NO--AP0102210

UNCLASSIFIED

2/2 023 UNCLASSIFIED PROCESSING DATE--16OCT70
CIRC ACCESSION NO--AP0102210
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. IT IS SHOWN THAT THIS TYPE OF
INTERFERENCE CAN DISPLAY ITSELF FOR E2 AND M1 NUCLEAR TRANSITIONS IF ONE
STUDIES THE ANGULAR DISTRIBUTION OF THE ELECTRON PRODUCED BY THE GAMMA
RAYS RATHER THAN THE TOTAL ABSORPTION. FACILITY: I. V.
KURCHATOV INST. ATOMIC ENERGY, MOSCOW, USSR.

UNCLASSIFIED

1/2 014 UNCLASSIFIED PROCESSING DATE--16OCT70
TITLE--INTERFERENCY OF NUCLEAR RESONANCE ELECTRON PRODUCTION AND
PHOTOEFFECT FOR MOESSBAUER E2 AND M1 GAMMA RAYS -U-
AUTHOR-(02)-AFANASEV, A.M., KAGAN, YU. K
COUNTRY OF INFO--USSR
SOURCE--PHYS. LETT. A 1970, 31(1), 38-9
DATE PUBLISHED-----70
SUBJECT AREAS--PHYSICS, NUCLEAR SCIENCE AND TECHNOLOGY
TOPIC TAGS--MOESSBAUER SPECTRUM, NUCLEAR RESONANCE, ANGULAR DISTRIBUTION,
INTERFERENCY MEASUREMENT, ELECTRON SPECTRUM, PHOTONUCLEAR REACTION,
ERBIUM ISOTOPE, YITTERBIUM ISOTOPE, DYSPROSIUM ISOTOPE, EUROPIUM
ISOTOPE, THULIUM ISOTOPE
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--1985/1469 STEP NO--NE/0000/70/031/001/0038/0039
CIRC ACCESSION NO--AP0101555
UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0101555

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE TITLE INTERFERENCE IS MANIFESTED IN THE ANGULAR DISTRIBUTION OF THE ELECTRON PRODUCED BY THE X RAYS RATHER THAN IN THE ABSORPTION SPECTRUM. ALTHOUGH THE DISTRIBUTION OF EMITTED ELECTORNS IS DIFFERENT FOR THE PHOTOEFFECT AND THE NUCLEAR PROCESS, THE INTERFERENCE IS OBSERVABLE COMPLETELY IF THE ELECTRON MOMENTUM DIRECTION IS FIXED. THE ENERGY DEPENDENCE OF THE (GAMMA E) REACTION HAS A SYM. CHARACTER BOTH FOR E2 AND M1 TRANSITIONS. A COMPARISON OF THE ANGULAR DEPENDENCE FOR THE INTERFERENCE TERM WITH THAT FOR THE INTERNAL CONVERSION PROVIDES A CHOICE OF AN OPTIMAL DIRECTION IN WHICH THE EFFECT WILL BE THE LARGEST. THE MEASUREMENT OF THE ELECTRON ANGULAR DISTRIBUTION GIVES A NEW POSSIBILITY OF EXPTL. INVESTIGATION OF THE INTERFERENCE FOR A WIDE SER OF NUCLEI. CRUDE ESTNS. GIVE THE ALRGEST EFFECTS FOR PRIME166 ER (80.5 KEV), PRIME170 YB (84.3 KEV), PRIME160 DY (86.8 KEV) E2 MOESSBAUER GAMMA QUANTA AND FOR PRIME169 TM (8.4 KEV) AND 151 EU (21.6 KEV) M1 TRANSITIONS. FACILITY: I. V. KURCHATOV INST. AT. ENERGY, MOSCOW, USSR.

UNCLASSIFIED

1/2 013 UNCLASSIFIED PROCESSING DATE--04DEC70
TITLE--LIQUID PHASE SYNTHESIS OF ALCOHOLS FROM CARBON MONOXIDE AND
HYDROGEN ON A MOLTEN IRON CATALYST -U-
AUTHOR-(04)-BASHKIROV, A.N., MOROZOV, L.A., LOKTEV, S.M., KAGAN, YU.B.
COUNTRY OF INFO--USSR
SOURCE--NEFTEPERERAB. NEFTEKHIM. (MOSCOW) 1970, (4), 49-50
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--ORGANIC SYNTHESIS, ALCOHOL, CARBON MONOXIDE, HYDROGEN,
CATALYST
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY FICHE NO----FD70/605019/B07 STEP NO--UR/0318/70/000/004/0049/0050
CIRC ACCESSION NO--AP0140901
UNCLASSIFIED

2/2 013

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0140901

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE SYNTHESIS CONDITIONS WERE SIMILAR TO THOSE OF THE GAS PHASE PROCESS, BUT HIGHER SPACE VELOCITIES WERE USED FOR REDUCING THE WATER CONC. IN THE CATALYST ZONE. THE OPTIMUM CONDITIONS WERE AT 200 ATM, SPACE VELOCITY GREATER THAN OR EQUAL TO 10,000 HR PRIME NEGATIVE, AND 160-62DEGREES. THE LIQ. PHASE PASSED THROUGH THE CATALYST IN A TUBULAR REACTOR, USING 1:10 CO-H, PROMOTED TYPICAL CATALYST, AND SYNTHINE, B. 270-300DEGREES WITH HIGH ALCS. AS LIQ. MEDIUM. THE REACTION PRODUCTS AND PART OF THE LIQ. PHASE WERE CARRIED AWAY BY THE GAS.

UNCLASSIFIED

USSR

UDC: 537.521

KAGAN, Yu. M., LYAGUSECHENKO, R. I., TAROYAN, A. S., KHVOROSTOVSKIY, S. N.,
Leningrad University imeni A. A. Zhdanov

"Concerning the Energy Distribution of Electrons in a Hollow Cathode"

Leningrad, Zhurnal Tekhnicheskoy Fiziki, Vol 43, No 7, Jul 73, pp 1488-1495

Abstract: An expression is found for the energy distribution of electrons in a hollow cathode right up to the first excitation potential with regard to elastic collisions of electrons with atoms. Calculated and measured electron energy distributions are compared. The calculated numbers of excitations for triple levels of helium are compared with measured line intensities.

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USSR

UDC 533.521

KAGAN, Yu. M., LYAGUSHCHENKO, R. I., and KHVOROSTOVSKIY, S. N.

"Electron Distribution by Energies and Excitation in a Hollow Cathode in a Mixture of Inert Gases"

Leningrad, Zhurnal Tekhnicheskoy Fiziki, No 11, 1973, pp 2332-2339

Abstract: This article is the continuation of three earlier papers by the authors named above, which dealt with the distribution of electrons according to energy and the intensity of the lines, in a hollow cylinder in an inert gas. Since the mixture of two gases is of practical interest, the present paper is concerned with measurements of electron energy distributions in a He-Ar mixture, in a cylindrical cathode with a diameter of 2 cm and a length of 10 cm for a current range of 25-100 ma, the cathode being set coaxially. The pressure relationship for the He and Ar was in three quantities: 2.7 mm Hg, 0.027 mm Hg; 2.7, 0.07; 1, 1.6. As in the three earlier works, the intensity of the He and Ar lines radiated by the whole cathode was measured. To compute these intensities, the authors obtained the electron distribution function $F(\epsilon)$, which is proportional to the number of electrons per energy interval unit close to the energy ϵ . Computed and experimental results are compared.

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USSR

UDC 537.52

KAGAN, Yu. M., TAROYAN, A. S.

"Excitation of a Helium-Neon Mixture in a Discharge in a Hollow Cathode. II"

Leningrad, Optika i Spektroskopiya, Vol 35, No 3, Spe 73, pp 417-421

Abstract: In their previous paper the authors investigated the electrical and optical characteristics of a discharge in a hollow cathode in helium. It was shown that by using the measured electron energy distribution function and deriving balance equations for different levels the line intensities and concentrations of excited atoms can be calculated. The calculated values agree with the measured data. A similar study is done in this paper for a helium-neon mixture. The measurements were made at a helium pressure of 1 mm Hg and a neon pressure of 0.1 mm Hg for currents of 10, 20, 40, 60 ma in a hollow cathode 20 mm in diameter and 100 mm long. The results are tabulated.

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USSR

UDC 537.523/.527

KAGAN, Yu. M., LYAGUSHCHENKO, R. I., KHVOROSTOVSKIY, S. N.

"Concerning the Intensities of Ionic and Atomic Lines in a Hollow Cathode"

Leningrad, Optika i Spektroskopiya, Vol 35, No 3, Sep 73, pp 422-426

Abstract: Based on a previously found energy distribution function, a calculation of the number of direct excitations of a number of atomic and ionic levels of helium and argon was made by the authors. The resultant values were compared with the integral intensities of the corresponding lines. It was found that in many instances there is excellent agreement between theory and experiment. The discrepancies observed in some cases are apparently due to failure to account for step-by-step excitations and quenching processes.

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USSR

UDC 537.52

GOLUBOVSKIY, YU. B., KAGAN, YU. M., and KOMAROVA, L. L.

"On the Emission of a Continuous Spectrum of Electron Retardation by Atoms in a Positive Argon Discharge Column"

Leningrad, Optika i Spektroskopiya, Vol 34, vyp 2, Feb 73, pp 226-229

Abstract: In the medium pressure region at $p > 1$ torr the emission spectrum of a positive inert-gas discharge column displays a continuous spectrum, whose intensity increases with an increase in pressure. It has been proved that this continuous spectrum is emitted during electron retardation by gas atoms. The expression for the intensity of the continuous spectrum I_ω is

$$I_\omega = n n_a h \omega \int_{\sqrt{\frac{2h\nu}{m}}}^{\infty} \frac{d\sigma(\epsilon)}{d\omega} f(\epsilon) d\epsilon$$

where n and n_a are the electron and atom concentrations, $d\sigma(\epsilon)$ is the cross section of the process in which an electron with energy ϵ during collision with an atom emits a quantum in the frequency range $\omega - \omega + d\omega$, and $f(\epsilon)$ is the

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GOLUBOVSKIY, YU. B., et al., Optika i Spektroskopiya, Vol 34, vyp 2, Feb 73, pp 226-229

energy distribution function of the electrons. It has been shown that this cross-section can be expressed through the total cross-section for the elastic scattering of electron by atom, and a formula has been given for the case in which the total elastic scattering cross-section does not depend on the velocity and the energy distribution of the electrons is Maxwellian. This formula can be generalized for the case in which the total cross-section does depend on the velocity. For a Maxwellian distribution of electrons with the temperature T it will take the form

$$I_{\omega} = 5 \cdot 10^{-3} \frac{n n_a}{n^2 c^2} h (kT)^{-1/2} \int_{h\omega}^{\infty} \sqrt{\epsilon - h\omega} \sqrt{\epsilon} \chi \times \\ \times \{ \epsilon (\epsilon - h\omega) + (\epsilon - h\omega) \sigma(\epsilon) \} e^{-\epsilon/kT} d\epsilon.$$

This formula was previously used by the authors to find the electron concentration n from the measured intensity I_{ω} in a positive neon and helium discharge column. However, whereas in helium the energy distribution of slow

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GOLUBOVSKIY, YU. B., et al., Optika i Spektroskopiya, Vol 34, vyp 2, Feb 73, pp 226-229

electrons is Maxwellian at any electron concentration n , in neon and argon the slow electron distribution can be considered Maxwellian only for a rather large electron concentration; i.e., for discharge currents which are not too small. This limitation can be avoided if formula (1) is used and if $f(\mathcal{E})$ is taken to be the following approximate expression for the distribution function valid for any electron concentration n :

$$f(u) = C \left(\frac{m}{2kT} \right)^{3/2} \exp \left[- \int_u^{\infty} \frac{1 + \gamma_2 \frac{u^2}{\lambda(u)}}{1 + \gamma_1 u \lambda(u)} du \right].$$

A comparison of the calculated intensity values with experimentally measured values shows satisfactory agreement.

The authors thank A. N. STAROSTIN for advising them of the form for formula (2), and R. I. LYAGUSHCHENKO for discussing the results.

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UDC 537.52: 546.291

KAGAN, YU. M. and TAROYAN, A. S.

"Excitation of Helium in a Discharge in a Hollow Cathode. I"

Leningrad, Optika i Spektroskopiya, Aug 73, pp 205-212

Abstract: The electrical and optical characteristics of a discharge in helium in a hollow cathode had been investigated in 1966 and 1967 by V. S. Borodin and Yu. M. Kagan (Hefs. 1-3 in the abstracted article). In the present work, dealing with the same subject, an attempt is made to improve the experimental research methods and to analyze more precisely the balance levels for the individual levels. Three sequentially placed and series-connected hollow cathodes (20 mm in diameter and 100 mm long) were used, with coaxial anodes and with a 10-mm gap between the cathodes. Thus, the length of the luminous column was three times longer than in the previous experiments. Emphasis is placed upon the fact that account was taken of mixing among the levels. Two figures, five tables.

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USSR

UDC 537.53

GOLUBOVSKIY, Yu. B., KAGAN, Yu. M., and KOMAROVA, L. L.

"Atomic Temperatures and the Broadening of Spectral Lines in the Positive Column of a Discharge in Argon"

Leningrad, Optika i Spektroskopiya, Vol 35, No 1, Jul 73, pp 14 - 18

Abstract: The atomic temperature in the positive column of a discharge is valuable information for a variety of purposes. Previous attempts to determine or measure this have been made, but for argon the process was complicated by an attempt to determine a number of factors simultaneously, forcing the use of several simplifying assumptions. The present study involves only the determination of the temperature of atoms in the argon from experimental values of the radial fall of electron concentration and the value of the longitudinal electric field. This narrower approach avoids many difficulties encountered in a complete, theoretical treatment of the discharge parameters.

Measurements were made of the contours of spectral lines at 6965 and 7147 angstroms from an argon discharge.

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GOLUBOVSKIY, Yu. B., et al., Leningrad, Optika i Spektroskopiya, Vol 35, No 1, Jul 73, pp 14 - 18

Tables published by Davis and Vaughan in Astrophysical Journal, Vol 137, page 1302, were used to determine the width of the Lorentz portion of the contour, consisting of the apparatus width and a width related to pressure effects. The apparatus width was independently determined and eliminated. The width due to the interaction with charged particles was calculated on the basis of tables published by Griem in Physical Review, Vol 128, page 515. The results indicated that the observed widening was due to interactions with neutral atoms. The change was found to be a linear function of the concentration of normal atoms on the axis. The result was found to agree fairly well with theoretical values calculated by L. A. Luizova (Candidate's Dissertation, Leningrad State University, 1969).

The agreement of measured and calculated temperatures, as well as the linear relationship with the concentration of normal atoms, indicates the correctness of the calculated temperature.

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USSR

UDC: 537.5 1

KAGAN, Yu. M., MILENIN, V. M., and MURADOV, A. K.

"Investigating the Parameters of the Plasma of a Modulated Discharge in Helium"

Leningrad, Zhurnal Tekhnicheskoy Fiziki, No 9, 1973, pp 2003-2004

Abstract: This brief communication describes experiments performed to investigate phenomena occurring when the current in a discharge in helium is modulated by frequencies in the range between a lower limit, at which frequency the electrons pass to the walls as a result of ambipolar diffusion, and an upper limit which is the frequency of formation of the electron distribution function according to energy. The apparatus for the experiments consisted of a cylindrical discharge tube with a heated cathode, the tube being 700 mm long with an inner diameter of 28 mm. On the tube axis at distances of 60 and 135 mm from the anode are two probes set at right angles to the axis. A block diagram of the tube and the rest of the equipment is given. Curves are plotted for the longitudinal electric field intensity as a function of the frequency, the electron distribution function according to energy, and the computed and experimentally measured electron distribution functions plotted 1/2

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UDC: 537.5 1

KAGAN, Yu. M., et al, Zhurnal tekhnicheskoy fiziki, No 9, 1973,
pp 2003-2004

on the same graph for the sake of comparison. Good agreement between the two is evident. The authors thank N. B. Kolokolov and A. Blagoyev for their advice, and V. Pulit for his assistance in processing the results.

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USSR

UDC: 533.9

KAGAN, Yu. M., LYAGUSHCHENKO, R. I., KHVOROSTOVSKIY, S. N.

"Mechanism Responsible for Formation of the Distribution Function of Electrons in a Hollow Cathode, and Absolute Emission Intensities"

Leningrad, Optika i Spektroskopiya, Vol 33, No 3, Sep 72, pp 430-435

Abstract: A mechanism is proposed for formation of the distribution function of fast electrons in a hollow cathode for the case in which the mean free path of the electrons is appreciably shorter than the dimensions of the cathode. Expressions are found for the distribution function, the number of direct ionizations, and the number of excitations for various levels of helium. The results of calculations are compared with the absolute intensities of a series of lines of He I and He II. The results show that the proposed model of formation of the distribution function of electrons gives a fairly close approximation of the absolute intensities for a number of ionic and singlet lines. The discrepancies which are observed for lines emitted from higher levels can be attributed more to the complexity of the balance equations for these levels than to failure of the model.

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USSR

UDC 537.535.1

GOLUBOVSKIY, Yu. B., KAGAN, Yu. M., KOMAROVA, L. I., Leningrad State University imeni A. A. Zhdanov

"Parameters of a Positive Column in Argon at Moderate Pressures"

Leningrad, Zhurnal Tekhnicheskoy Fiziki, Vol 42, No 11, Nov 72, pp 2366-2370

Abstract: The theory of a positive discharge column in inert gases at moderate pressures is briefly outlined, and the results of measurements of the electric and optical parameters of a positive discharge column in argon at pressures from 10 to 80 mm Hg and discharge currents from 5 to 500 ma are presented for a tube radius of 1.2 cm. The measurements are compared with theoretical data.

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USSR

WAGNER, S. D.; KAGAN, Yu. M.; SLYSHOV, A. G.

"Electrical and Optical Measurements in a Pulsed Discharge in Helium. II"

Leningrad, Optika i Spektroskopiya; April, 1972; pp 650-2

ABSTRACT: The authors measure the variation, with time, of the intensity of the atomic helium series of lines. After termination of a pulse of current through a tube the intensity of the lines does not drop monotonically. After a rapid drop, it reaches a maximum, and only then does it drop. The maximum lasts for several microseconds for all lines after termination of the pulse. The ratio of the intensity at the maximum to the intensity at the instant of termination of the pulse increases for lines of one series with an increase in the principal quantum number of the radiation level. The dependence of this phenomenon on the diameter of the tube and discharge current was studied.

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USSR

UDC 533.9

VAGNER, S. D., KAGAN, YU. M., SLYSHOV, A. G.

"Electrical and Optical Measurements in a Pulsed Discharge in Helium. I"

Leningrad, Optika i Spektroskopiya, No 6, Dec 71, pp 876-880

Abstract: Plasma parameters directly before the beginning of de-ionization were measured in order to study the process of the afterglow of a helium discharge. A pulsed discharge in a cylindrical discharge tube of length 20 cm and diameter 10 mm with cylindrical cold electrodes was investigated. A pulsed generator supplying rectangular pulses of current of 20 usec duration with a repetition frequency of 70 Hz was used as a power supply. The measurements were made at current amplitudes in the pulse of 0.8, 3.2, and 3.6 and at helium pressures of 2, 5 and 10 torr. Two cylindrical probes of length 5 mm and diameter 0.2 mm oriented along the axis were inserted into the tube. The longitudinal electric field strength E and the electron temperature T_e were measured with these probes. The atomic spectrum and the continuous spectrum observed under these conditions were also measured

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VAGNER, S. D. et al, Optika i Spektroskopiya, No 6, Dec 71, pp 876-880

in addition to the probe measurements. The electron concentration, the atom concentration, E , and T_e were measured at the lower excited levels 2^1S_0 , 2^1P_1 , 2^3S_1 , and 2^3P_{012} . The radial distribution of the intensities of the lines 5016, 7281, 3639, 5876, and 7065 Å was also measured. The absolute intensities were measured for several lines emitted from levels with major quantum numbers 3, 4, and 5, and the balance equation for these levels was tested. The energy difference between levels with the same major quantum number was not great and mutual transitions existed between them. A comparison between the number of excitation events and the sum of decay events shows that the difference in the majority of cases does not exceed several orders of magnitude. It is noted that with an increase in the major quantum number, the role of multistage ionization becomes predominant in comparison with the decay of levels through radiation.

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USSR

UDC 533.9.082.5

BORODIN, V. S., GEBEKOV, V. D., GINDINA, V. F., KAGAN, Yu. M.

"Diagnostics of the Plasma of a Pulse Discharge in Hydrogen,
Part II"

Leningrad, Optika i Spektroskopiya, No 1, Jan 72, pp 17-21

Abstract: As indicated in the title, this article is the second part of a paper begun in volume 31, 1971, p 525. The first part dealt with the theory of plasma diagnostics; the present half is concerned with the experimental verification of the theoretical conclusions derived. For these experiments, the authors used a pulse discharge in a chamber made of 4-cm thick plexiglass, measuring 20 cm on a side, the chamber being cubic in shape. The electrodes were tungsten rings with an inner diameter of 0.7 cm, placed 1.2 cm apart in the chamber. Quartz windows were set in both sides of the chamber for the purposes of observation. The hydrogen filling the chamber had a pressure of 400-760 mm Hg, and

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BORODIN, V. S. et al, Gotika i Spektroskopiya, No 1, Jan 72,
pp 17-21

the discharge in the chamber was made with a capacitor of 72 μ F charged from a rectifier. Diagrams of the equipment are given, as well as pulse-shape photographs. A table of electron concentrations measured in accordance with a method described in the first half of the article is provided.

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USSR

UDC 533.9

BORODIN, V. S., GEBEROV, V. D., and KAGAN, Yu. M.

"Diagnosis of a Plasma With Pulse Discharges in Hydrogen"

Leningrad, Optika i Spektroskopiya, Vol 31, No 4, 1971, pp 525-528

Abstract: This is the first of a series of articles. In this particular installment, the question of determining the electron concentration in a plasma is examined by considering pulse discharges in hydrogen. The assumption is made that the plasma is in a state of local thermodynamic equilibrium so that a set of three equations for the electron, ion, and atom concentrations in the normal state; for the pressure of the gas; and for the intensity of the hydrogen line applicable for such a state can be used. The further assumption is made that the pressure of the hydrogen is constant and that the plasma is quasi-neutral, thus assuming that the electron and ion concentrations are equal. Formulas are developed for the intensity distribution of the hydrogen line as a function of time, and an expression is found through which the initial electron concentration can be found simply by measuring the relative course of the intensity at the center of the line and the half-width averaged over the time interval.

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UDC 537.525.1

KAGAN, YU. M., and MITROFANOV, N. K.

"Energy Spectrum of Electrons in a Striated Column of a Glow Discharge in Hydrogen"

Leningrad, Zhurnal Tekhnicheskoy Fiziki, Vol 41, Issue 10, Oct 71,
pp 2065-2072

Abstract: Investigations were conducted on the striated form of a discharge in hydrogen at various pressures and densities. The striated structure of the discharge column was controlled by means of a metal diaphragm located in the vicinity of the cathode. The diaphragm, not connected externally, could be positioned with the help of a magnet.

Measurements of electron energy were made by means of the current flowing through a probe located between the diaphragm and the anode. This current was modulated by means of an a.c. potential, and the harmonics of the probe current corresponding to the modulating frequency was then used to determine the second derivative of the probe current with respect to the probe voltage. The required distribution function was then determined from the derivative. Electron density was found by integrating the energy distribution function.

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KAGAN, YU. M. and MITROFANOV, N. K., Zhurnal Tekhnicheskoy Fiziki, Vol 41, Issue 10, Oct 71, pp 2065-2072

Results were presented in the form of series of curves for different discrete values of pressures and discharge currents. It was observed that high-energy electrons were concentrated in the vicinity of the cathode and that they lost their energy gradually through inelastic collisions and scattering (drift) towards the walls of the tube as they moved through the region of lower potential gradients. Isotropy of electron velocities was not observed in the present experiments; on the contrary, a considerable non-uniformity of the positive column was noted, with fast-particle groups present everywhere.

A special probe was used for detecting and measuring the radial component of electron velocities. Caution was recommended for this type of measurement, particularly if a spherical probe was to be used, since the probe distorts the shape of the electric field in its vicinity and the assumption of the spherical character of the field components is no longer justified.

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USSR

UDC 537.52+539.186].01

GOLUBOVSKIY, Yu. B., KAGAN, Yu. M., and LYAGUSHCHENKO, R. I.

"Population of Resonance Levels in a Cylindrically Configured Discharge"

Leningrad, Optika i Spektroskopiya, Vol 31, No 1, Jul 71, pp 22-29

Abstract: The authors have used an approximate method to solve the equation of transport of radiation in the case of cylindrical geometry for large coefficients of absorption k_0R and for a dispersion shape of the spectral line. They found the matrix of the system of algebraic equations approximately equivalent to the initial integral equation; using this it was easy to use a computer for their numerical calculations. When it was possible for them to ignore the quenching of the resonance levels, they were able to find an inverse matrix which allowed them to obtain a solution for various types of excitation functions of the resonance level $\lambda(r)$ and various parameters of the problem without resorting to the computer. By making use of the approximation method of moments, they were able to find a rather simple analytical expression for the concentration of resonance atoms $n(r)$. The authors employ 6 figures and 2 tables to substantiate their findings. The article contains a bibliography of 6 titles.

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USSR

UDC: 621.372.6.01

KAGAN, Yu. M., KOLCKOLOV, N. B., LYAGUSHCHENKO, R. I., MILENIN
V. M., and MIRZABEKOV, A. M.

"Investigating the Electron Distribution Function in Hg+Ar and
Hg+Kr Mixtures"

Leningrad, Zhurnal Tekhnicheskoy Fiziki, vol. 41, No. 4, April
1971, pp 714-719

Abstract: The measurements made in this article were of the energy distribution of electrons in the positive column of discharges in gases mixing mercury vapor and inert argon and krypton. Such measurements are of practical interest. Because difficulties arise as the result of intense noise, in making these measurements the authors used a tracking probe through which the effect of the space potential variations on the measurement of the distribution function can be eliminated. The measurements were made in a tube measuring 35 mm in diameter with an incandescent cathode. Curves of the distribution are plotted. A comparison

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KAGAN, et al, Zhurnal Tekhnicheskoy Fiziki, vol. 41, No. 4, April 1971, pp 714-719

was also made of the experimental distribution functions and the functions calculated from the kinetic equation. The estimates made indicate that elastic collisions of electrons and the mercury atoms are negligible compared to the elastic collisions with the inert gas atoms. The authors are associated with the Leningrad State University, imeni A. A. Zhdanov.

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USSR

UDC 535.9

BYKHOVSKIY, D. G., GOLUBOVSKAYA, S. M., GOLUBOVSKIY, Yu. B., and KAGAN, Yu. M.

"Spectroscopic Study of Plasma Parameters at the Output of a Plasmatron. II"

Leningrad, Optika i Spektroskopiya, No. 5, May 71, pp 836-840

Abstract: The radial change in the parameters of a plasma at the output of a plasmatron was calculated on the basis of measurements of the brightness of spectral lines of ArI and H α . The measurements were made in pure argon and in an argon-hydrogen mixture. The addition of hydrogen led to a rise in temperature at the axis and to a sharper falling off. The concentration of argon atoms in the center was lowered and they were drawn to the periphery of the arc. Electron concentrations measured on the basis of shift and on the basis of the intensity of spectral lines in pure argon were compared. The measurements are presented in graphical form.

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Magnetohydrodynamics

USSR

KAGAN, Yu. M.; et al (Leningrad Order of Lenin State University)

"Study of Moving Striations in Neon"

Leningrad, Zhurnal Tekhnicheskoy Fiziki; January, 1971; pp 120-5

ABSTRACT: By means of an improved probe method, the authors made a study of the basic parameters of moving striations in neon in the interval of 13-60 ma with pressures of 0.7 to 4.0 tor. Under these conditions they studied the behavior of the following variables of the striation: the distribution of electrons with respect to energy, concentration and average energy of the electrons, and distribution of the plasma potential. They calculated the respective average values based on these measurements. The table shown gives the lengths and frequencies of the striations observed in neon.

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KAGAN, Yu. M., Zhurnal Tekhnicheskoy Fiziki, January, 1971; pp 120-5

$i = 13 \text{ ma}$			$p = 2.2 \text{ tor}$		
p, tor	f, kc	λ, mm	i, ma	f, kc	λ, mm
4	1.5	73	40	2.4	84
2.7	1.55	73	60	2.25	81
2.2	1.75	66	—	—	—
0.8	1.05	33	—	—	—

The article includes 7 equations and 9 figures. There are 14 references.

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UDC 537.525 : 546.292

USSR

KAGAN, YU. M., KOLOKOLOV, N. B., and MILENIN, V. M.

"Electrical and Optical Measurements in Moving Striations in Neon. I"

Leningrad, Optika i Spektroskopiya, Vol 29, No 6, Dec 70, pp 1041-1044

Abstract: The article describes results of a study of the electrical and optical parameters of moving striations in neon. Such studies permit quantitative elucidation of the pattern of excitation and ionization in moving striations with allowance for the specific character of the electron distribution. An earlier article by the authors described a method making it possible to measure the energy distribution of electrons in moving striations. The present article uses this method to measure the energy distribution of electrons in different phases of moving striations in a neon discharge in a tube with a 2.5-cm radius at a pressure of 0.75 torr and discharge currents of 120 and 200 ma, with the strata length 17 and 18 cm respectively.

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USSR

UDC 537.525

KAGAN, Yu. M., KOKOLOV, N. D., and MILENIN, V. M.

"Electrical and Optical Measurements in Traveling Strata in Neon. II"

Leningrad, Optika i Spektroskopiya, Vol 30, No 2, 1971, pp 209-210

Abstract: The absolute intensities of the 5852, 6074, 5945, 6678, and 6096 Å lines were measured for the $3p^1S_0$, $3p^3P_2$ levels of neon along traveling strata, allowing the number of excitations and number of radiated quanta to be compared for these levels. The measurements indicated that ordinary spectroscopic measurements yield values for line intensities which are equal to the averages and for concentrations of excited atoms which are in many cases near the averages.

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USSR

UDC 537.525:546:293

VAGNER, S. D., VIROLAYNEN, V. A., KAGAN, Yu. M.

"Energy Distribution of Electrons and Optical Properties of High-frequency Argon Discharge"

Leningrad, Optika i Spektroskopiya, Vol 28, No 1, Jan 70, pp 192-195

Abstract: Energy distribution functions were measured for electrons in a high-frequency argon discharge at a frequency of 28 Mhz in the 0.05-0.25 torr pressure range at currents of 50-150 ma. The resultant distribution functions were used to estimate the role of various processes affecting the balance of the $3p^54s$ and $3p^54p$ levels of argon. Balance equations were calculated for the system of $3p^54s$ levels and the system of $3p^54p$ levels. The results indicate the possibility of calculating optical characteristics of a high-frequency discharge on the basis of experimentally found distribution functions. The authors thank I. S. Niskonen for assisting in the work.

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1/2 017 UNCLASSIFIED PROCESSING DATE--16OCT70
TITLE--BOUND NEUTRONS IN MATTER -U-
AUTHOR--KAGAN, YU.M. *R*
COUNTRY OF INFO--USSR
SOURCE--PIS'MA ZH. EKSP. TEOR. FIZ. 1970, 11(4), 235-9
DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS
TOPIC TAGS--NEUTRON, HALF LIFE, LOW TEMPERATURE EFFECT

CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1988/0669 STEP NO--UR/0386/70/011/004/0235/0239
CIRC ACCESSION NO--AP0105645
UNCLASSIFIED

2/2 017

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0105645

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AN ANAL. OF THE DATA OBTAINED BY GRANT AND COBBLE (1969) DEMONSTRATES THAT IT IS POSSIBLE FOR A LONG LIVED BOUND N TO EXIST IN MATTER. THIS OCCURS UNDER GIVEN CONDITIONS IN AN IRREGULAR MEDIUM AT LOW TEMP. BECAUSE OF THE USUAL NUCLEAR INTERACTION. NO QUANT. ANAL. WAS POSSIBLE.

UNCLASSIFIED

USSR

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KAGAN, YU. M., DESAI, SH. K.

"Excitation of a Helium-Neon Mixture in a Hollow Cathode. Part II"

Leningrad, Optika i Spektroskopiya; April 1970, pp 650-3

ABSTRACT: The article concerns the rate equations for the levels with $n = 3$ of helium and $2p^5 3p$ of neon. Satisfactory agreement between calculated and experimentally determined measurements of the intensity of the spectral lines was found. The question of population inversion of the $3s_2$ and $2p_4$ levels and $2s_2$ and $2p_4$ levels of neon was also considered. Population inversion at these levels over the entire range of pressures and discharge currents studied was determined.

The article includes 3 equations and 4 tables of data. There are 10 bibliographic references.

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K Magneto hydrodynamics

USSR

UDC 533.933

KAGAN, YU. M., KOLOKOLOV, N. B., MILENIN, V. M., MERZABEKOV,
A. M., Leningrad State University

"Measurement of the Energy Distribution of Electrons in a Plasma
in the Presence of Noise"

Leningrad, Zhurnal Tekhnicheskoy Fiziki, Vol 40, No 5, June 1970,
pp 1319-1321

Abstract: Serious difficulties caused by fluctuations in the discharge for plasma diagnostics generally and probe diagnostics in particular are examined. It is noted that the sensitivity and, in certain cases, the applicability of the probe method are considerably limited by the intensity of discharge noises. The effect of noises on a technique using modulation of the probe current to study electron distribution is said to be a masking of the signal of the second derivative on the one hand and a distortion of the shape of the distribution itself on the other, due to oscillations in the potential of the space where the probe

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KAGAN, YU. M., et al, Zhurnal Tekhnicheskoy Fiziki, Vol 40, No 5, June 1970, pp 1319-1321

is located. The "tracking" probe method is proposed for measuring the energy distribution of electrons in the presence of noise. The authors showed earlier that to obtain the real averaged distribution function in the presence of periodic plasma fluctuations the variable component of the potential of the measuring probe must "track" the space potentials. The following principle was used for measurements in a plasma in the presence of oscillations: a reference probe at the potential of the floating probe was placed close to the measuring probe. The change in the floating potential of this probe caused by oscillations of the plasma is transmitted to the circuit of the measuring probe. In the experiments described, an emitter follower with the following characteristics was used: input resistance 1 mw, output resistance 5 Ω , transmission band 30-600,000 Hz. The SK-4-3 spectral analyzer was used to analyze the spectrum and the amplitude of the noises. The energy distribution of electrons in a mercury-argon mixture at a mercury vapor pressure of $2.5 \cdot 10^{-3}$ torr and an argon pressure of 0.6 torr was measured for a discharge current of 100 ma. The spectrum of oscillations between

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USSR

KAGAN, YU. K., et al, Zhurnal Tekhnicheskoy Fiziki, Vol 40, No 5, June 1970, pp 1319-1321

the measuring probe and the ground before and after inclusion of the emitter follower is given. It was shown that the application of the tracking probe method makes it possible to measure the distribution function in a plasma in the presence of noises when the use of the ordinary method leads to erroneous results.

3/3

1/2 032 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--PROPERTIES OF ALKALI METALS -U-
AUTHOR--(03)-BROYMAN, YE.G., KAGAN, YU.M., KHOLAS, A.
COUNTRY OF INFO--USSR
SOURCE--FIZ. TVERD. TELA 1970, 12(4), 1001-13
DATE PUBLISHED-----70
SUBJECT AREAS--MATERIALS, CHEMISTRY
TOPIC TAGS--ALKALI METAL, EQUATION OF STATE, SODIUM, POTASSIUM, ELASTIC
MODULUS
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1998/0949 STEP NO--UR/0131/70/012/004/1001/1013
CIRC ACCESSION NO--AP0121551
UNCLASSIFIED

2/2 032

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0121551

ABSTRACT/EXTRACT--(U) GP-O- ABSTRACT. THE BOND ENERGY, ELASTIC MODULI, EQUATION OF STATE, AND PHONON SPECTRUM OF NA AND K WERE INVESTIGATED BY USING A 2 PARAMETER PSEUDO POTENTIAL. GOOD AGREEMENT WITH EXPTL. DATA WAS OBSD.

UNCLASSIFIED

1/2 056 UNCLASSIFIED . PROCESSING DATE--20NOV70
TITLE--SPECTROSCOPIC STUDY OF PLASMA PARAMETERS IN THE OUTPUT OF A
PLASMATRON. I. RADIAL DISTRIBUTION OF ELECTRON CONCENTRATION IN ARGON
AUTHOR--(03)--GOLUBOVSKAYA, S.M., GOLUBOVSKIY, YU.B., KAGAN, YU.M.

CCOUNTRY OF INFO--USSR

SOURCE--OPT. SPEKTROSK. 1970, 28(2), 223-7

DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--SPECTROSCOPY, ARGON, ELECTRON, CONCENTRATION GRADIENT,
SPECTRAL LINE, LINE WIDTH, LINE SHIFT, DISTRIBUTION THEORY, FLOW
ANALYSIS, GAS FLOW/(U)DFS8 SPECTROGRAPH

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRA--1992/1781

STEP NO--UR/0051/70/028/002/0223/0227

CIRC ACCESSION NO--AP0112767

UNCLASSIFIED

2/2 056

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0112767

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ELECTRON CONC. IN AR WAS MEASURED ON THE BASIS OF THE WIDTH AND SHIFT OF THE AR I 7067, 7504, AND 7635 ANGSTROM LINES IN A PLASMATRON AT 100 AND 200 ANGSTROM; THE NOZZLE DIAMS. WERE 3 AND 4 MM, AND THE RATE OF FLOW OF THE GAS WAS 1000-1500 L.-HR. A DFS-8 SPECTROGRAPH (6 ANGSTROM-MM), CROSSED WITH A FABRY-PEROT STANDARD, WAS USED AS A MONOCHROMATOR FOR THE PRELIMINARY DISPERSION. A DISCHARGE AT 1 TORR AND 50 MA WAS USED AS A SOURCE OF NARROW NONSHIFTED LINES. BY BOTH THE WIDTH AND SHIFT, THE SAME MEAN ELECTRON CONC. VALUES (0.8 TIMES 10 PRIME17-CM PRIME3) WERE OBTAINED. THE RADIAL DISTRIBUTION OF ELECTRON CONC. IN AR WAS DETD. ON THE BASIS OF SPECTRAL LINE SHIFT; THIS METHOD IS MORE SUITABLE, SINCE NO ELIMINATION OF APP. AND DOPPLER CONTOURS IS NEEDED.

UNCLASSIFIED

1/2 026 UNCLASSIFIED PROCESSING DATE--27NOV70
TITLE--EXCITATION OF A HELIUM NEON MIXTURE IN A HOLLOW CATHODE. PART II
-U-
AUTHOR-(02)-KAGAN, YU.M., DESAI, SH.K.
COUNTRY OF INFO--USSR
SOURCE--LENINGRAD, OPTIKA I SPEKTROSKOPIYA; APRIL 1970, PP 650-3
DATE PUBLISHED-----70
SUBJECT AREAS--PHYSICS
TOPIC TAGS--EMISSION SPECTRUM, ELECTRON STRUCTURE, HELIUM, NEON,
CALCULATION, ARC DISCHARGE
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--3006/0709 STEP NO--UR/0051/70/000/000/0650/0653
CIRC ACCESSION NO--AP0134444
UNCLASSIFIED

2/2 026

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AP0134444

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ARTICLE CONCERNS THE RATE EQUATIONS FOR THE LEVELS WITH N EQUALS 3 OF HELIUM AND 2P PRIME5 3P OF NEON. SATISFACTORY AGREEMENT BETWEEN CALCULATED AND EXPERIMENTALLY DETERMINED MEASUREMENTS OF THE INTENSITY OF THE SPECTRAL LINES WAS FOUND. THE QUESTION OF POPULATION INVERSION OF THE 3S SUB2 AND 2P SUB4 LEVELS AND 2S SUB2 AND 2P SUB4 LEVELS OF NEON WAS ALSO CONSIDERED. POPULATION INVERSION AT THESE LEVELS OVER THE ENTIRE RANGE OF PRESSURES AND DISCHARGE CURRENTS STUDIED WAS DETERMINED.

UNCLASSIFIED

1/2 034 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--ENERGY DISTRIBUTION OF ELECTRONS AND OPTICAL PROPERTIES OF A HIGH
FREQUENCY ARGON DISCHARGE -U-
AUTHOR-(G3)-VAGNER, S.D., VIROLAYNEN, V.A., KAGAN, YU.M.
COUNTRY OF INFO--USSR
SOURCE--GPT. SPEKTROSK. 1970, 28(1), 192-5
DATE PUBLISHED-----70
SUBJECT AREAS--PHYSICS
TOPIC TAGS--ELECTRON ENERGY LEVEL, DISTRIBUTION FUNCTION, ARGON, HIGH
FREQUENCY DISCHARGE, LUMINESCENCE
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--1976/0440 STEP NO--UR/0051/70/028/001/0192/0195
CIRC ACCESSION NO--AP0042475
UNCLASSIFIED

2/2 034

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0042475

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ENERGY FUNCTIONS, DETD. FOR AR AT HIGH FREQUENCY DISCHARGE (28 MHZ) AT 0.05-0.25 TORR AND 50-150 MA, AGREE QUAL. WITH THE DATA OBTAINED BY UU. M. KAGAN, ET AL. (1966). ENERGY DISTRIBUTION FUNCTIONS WERE CALCD. FOR 3P PRIME5 4S AND 3P PRIME5 4P EXCITED STATES. CALCN. FOR THE 3P PRIME5 4S STATE GAVE GOOD AGREEMENT WITH THE OBSD. LUMINESCENCE OF THE EXCITED AR ATOMS.

UNCLASSIFIED

USSR

UDC 612.014.3

DISHOVSKIY, Kh. D., KAGAN, Yu. S., KOVTUN, S. D., KOKSHAREVA, N. V.,
TODIONOV, G. O., and SASINOVICH, L. M., Division of Experimental Toxicology,
All-Union Institute of the Hygiene and Toxicology of Pesticides, Polymers,
and Plastics

"The Physiological Mechanism of the Action of Dipyroxime"

Kiev, Fiziologichniy Zhurnal, Vol 19, No 3, May/Jun 73, pp 310-314

Abstract: Therapeutic administration of dipyroxime to rats poisoned with the insecticides DDVP (0,0-dimethyl-2,2-dichlorovinyl phosphate) and chlorophos resulted in a partial reactivation of cholinesterase in the brain, spinal cord, and striated muscles, as shown by histochemical data. Cytophotometric studies showed that the reactivation of cholinesterase under the effect of dipyroxime in the brain of animals poisoned with DDVO was most pronounced in the caudate nucleus - putamen complex. Electromyographic investigation indicated a beneficial effect of dipyroxime on the transmission of impulses in nerve-muscle synapses. The results of the study of the physiological action of dipyroxime substantiated the conclusion arrived at in earlier work that this drug is effective in the treatment of poisonings with DDVP and chlorophos (cf. Kagan et al, Farmakol. i Toksikol., 3, 359, 1971).

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USSR

UDC 632.95

KAGAN, YUL. S., KLISENKO, M. A., and PAN'SHINA, T. N.

"Some Questions in the Quantitative Toxicology of Organophosphorus Compounds"

V sb. Khimiya i primeneniye fosfororgan. sovedin. (Chemistry and Application of Organophosphorus Compounds -- Collection of Works), Moscow, "Nauka," 1972, pp 438-448 (from RZh-Khimiya, No 14, 25 Jul 72, Abstract No 14N448 by T. A. Belyayeva)

Translation: In vivo experiments during study of the neutralization of organophosphorus compounds (OPC) confirmed the regularity noted during in vitro investigations, viz. that there is a correlation between the rate of neutralization and the degree of toxicity. Neutralization of OPCs in insects takes place considerably more slowly than in the organism of warm-blooded animals, and this is the basic reason for the selectivity of OPCs for insects.

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USSR

UDC 541.69:661.718.1

MASTRYUKOVA, T. A., SHIFOV, A. E., GORBENKO, E. B., KABACHNIK, M. I., KAGAN, YU. S., YERSHOVA, YE. A., SRABANOVA, M. P., and SAVCHENKO, K. N., Institute of Heteroorganic Compounds, Academy of Sciences USSR

"A New Type of Selective Organophosphorus Insecticides and Acaricides. 2. Methylthiophosphonic Acid Derivatives"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 9, Sep 71, pp 2003-2005

Abstract: In an earlier article the authors examined a new type of selective insecticides and acaricides, viz. derivatives of mono- and dithiophosphoric acids containing amino acid residues, their esters and methylamides. The present article deals with an analogous series of methyl dithiophosphonates, obtained by the reaction of the corresponding chloroacetyl derivatives of amino acids or their esters with ammonium O-ethyl methylthiophosphonate. It was found that compounds of this series are more toxic for arthropods and warm-blooded animals than the corresponding dithiophosphates. Substances containing a free carboxyl group are the least toxic. A study of the insecticidal and acaricidal activity of the resultant compounds shows that they are more characterized by acaricidal activity and that they are more

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USSR

MASTRYUKOVA, T. A., et al., Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 9, Sep 71, pp 2003-2005

active insecticides and acaricides than the corresponding phosphates, but the selectivity of their effect on arthropods is weaker than in the case of dithiophosphates. A comparison of the effect of these two groups on arthropods and warm-blooded animals shows greater selectivity in the case of methyl dithiophosphates.

2/2

KAGAN, YU. S.

Science
USSR

JPRS 56168
5 June 1972

STEREOL AND IMPROVEMENT OF PROPERTIES OF
ESTERS CONTAINING A TRICHLOROETHYL GROUP.
THE PREPARATION OF ESTERS

Article by Yu. S. Kagan, M. S. Borodach, I. I. Svirin, A. P. Gel'fer, Yu. S. Kagan, O. To. Kiy, V. L. Tarakanovskiy, Ya. G. Tishchenko, I. L. Pechenkin, Institute of Petrochemical Synthesis Acad. A. V. Topolov, USSR Academy of Sciences, Moscow, (vol. 14, No. 1, 1972, 14 pages to press 9 July 1971, pp 326-333)

It is known that the physiologically active phosphoric compounds — cholinesterase inhibitors are pentavalent phosphoric compounds generally represented by the formula:



Here A and B are the forming alkyl, aryl, and other groups; X is the weak acid residue. Subsequently, the X bond with phosphorus has an anhydride character and the substance itself has the properties of a phosphorylating agent. Utilized in the capacity of group X were precursors of hydrofluoric acid and dicyclopentadiene acid, phenols and mercaptans of variable structure and others.

Trichloroalkoxy groups were used in the present work for X since it is known that the corresponding alcohols containing a trichloromethyl group are synthesized and investigated. A number of trichloromethylphosphoric acid esters and aromatic esters are colorless, slightly mobile liquids with a weak odor, and poorly soluble in water. The synthesis scheme includes the following reactions:

- 1 - [I - USSR - D]

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UDC 615.917:547.1'118].085.356:577.153.9.024

KAGAN, Yu. S., SASINOVICH, L. M., and DANILENKO, L. P., Laboratory of General Toxicology, All-Union Scientific Research Institute of Hygiene and Toxicology of Pesticides, Polymer and Plastic Substances, Kiev

"Comparative Evaluation of the Therapeutic Effect of Dipyroxime in Poisoning of the Experimental Animals With Some Organophosphorus Compounds"

Moscow, Farmakologiya i Toksikologiya, Vol 34, No 3, May-Jun 71, pp 359-362

Abstract: Dipyroxime, a cholinesterase reactivator, and an analog of TMB-4, exhibited definite therapeutic effect in rats, mice and cats poisoned with organophosphorus insecticides: chlorophos, DDVF, and phthalophos (0,0-dimethyl S-phthalimidomethyl dithiophosphate). Dipyroxime used in combination with atropine was more effective than either compound alone, except in the case of chlorophos, where atrophine and dipyroxime individually had higher, nearly equal results. The combined drugs were more effective in treating cats and rats than mice. Both compounds were most effective in counteracting DDVR poisoning, less so with phthalophos, and least effective with chlorophos poisoning. Dipyroxime reactivates the cholinesterase in erythrocytes, serum and in liver of the test animals. The return to normal of the enzyme activity in brain is less dramatic.

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USSR

UDC 615.9.015.7.07(049.3)

KAGAN, YU. S., Professor, All-Union Scientific Research Institute of the
~~Hygiene and Toxicology~~ of Pesticides, Polymers, and Plastics, Kiev

"Methods of Studying the Cumulative Properties of Toxic Substances"

Moscow, Gigiyena i Sanitariya, No 3, Mar 71, pp 88-91

Abstract: The author takes a critical view of the methods suggested by Krasnowskiy, Korolev, and Shigan to study the cumulative effects of toxic substances. The term "zone of cumulative effect" given to the ratio of LD_{50} over the threshold dose is a misnomer. It should preferably be called the zone of chronic effect to avoid confusion with the concept of the zone of toxic or acute effect represented by the ratio of LD_{50} over the dose causing acute pathology. The functional overload method, though theoretically correct, is practically useless because it can be applied only at the end of the experiment, thus making the study of graded, cumulative effects impossible. The statement that one should regard $1/125 LD_{50}$ as an effective dose is unfortunate, because any amount of a toxic substance introduced into the body exerts an effect, even if the latter is not very harmful. Therefore, it is incorrect to equate an effective dose with a threshold dose.

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USSR

UDC 632.95

KAGAN, YU. S., LUKANEVA, A. M.

"New Experimental Data on Action of DDT on Certain Physiological Systems of Warmblooded Animals"

Sb. Tr. N.-I. In-t Gigiyeny Truda i Profzabolevaniy, GruzSSR (Collection of Works of Scientific Research Institute of Labor Hygiene and Occupational Diseases, Georgian SSR), 1970, Vol 12, pp 207-210 (from RZh-Khimiya, No 18, 25 Sep 70, Abstract No 18N603, by P. V. Popov)

Translation: From new data obtained in experiments on laboratory animals, small amounts of DDT that can enter the organism from its environment cause harmful changes in DDT-sensitive systems of the organism.

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USSR

UDC 614.7:615.285.7:632.95]-099

TRANSTENBERG, I. N., Professor. KAGAN, Yu. S., Professor. BELONOVZHKO, G. A., Doctor of Medical Sciences, ANTONOVICH, Ye. A., Candidate of Medical Sciences, and POL'CHENKO, V. I., Candidate of Medical Sciences, All Union Scientific Research Institute of Hygiene and Toxicology of Pesticides, Polymers, and Plastics, Ministry of Health USSR, and Kiev Medical Institute

"Pesticides and Problems of Hygiene"

Moscow, Gigiyena i Sanitariya, No 7, Jul 70, pp 14-17

Abstract: The following topics were discussed: the increasing use of pesticides all over the world, the mounting number of reported poisonings (from 1,700 cases in the period 1945-1949 to over 15,000 in the period 1955-1959), the varied effects of soil and water pollution, and the ability of some pesticides to interact with food proteins, fats, and vitamins and to alter the specific and nonspecific reactivity of the body to many pathological agents and physiological stimuli. These conditions require a massive research effort as a preliminary step in the intelligent control of the use of these toxic compounds. Of major importance is the development of adequate animal models to study the remote effects of pesticides, to determine the possibility of extrapolating the data to man, and to predict the potential dangers to health from low concentrations of the toxins.

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1/2 020
UNCLASSIFIED
PROCESSING DATE--30OCT70
TITLE--EFFECT OF SEVIN ON LIVER FUNCTION AND STRUCTURE -U-
AUTHOR--(05)--KAGAN, YU.S., RODIONOV, G.A., VORONINA, L.YA., VELICHKO, L.S.,
KULAGIN, O.M.
CCUNTRY OF INFO--USSR
SOURCE--FARMAKOL. TOKSIKOL. (MOSCOW) 1970, 33(2), 219-24
DATE PUBLISHED--70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES
TOPIC TAGS--PESTICIDE, LIVER, RABBIT, CHOLINESTERASE, ENZYME ACTIVITY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRA--2000/0162

STEP NO--UR/0390/70/033/002/0219/0224

CIRC ACCESSION NO--AP0123933

UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--30OCT70

2/2 020

CIRC ACCESSION NO--AP0123933

ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. PROLONGED ADMINISTRATION OF SEVIN TO RABBITS AND RATS CHANGED LIVER FUNCTION AND REDUCED THE CHOLINESTERASE ACTIVITY IN THE BLOOD AND INTERNAL ORGANS. SEVIN INTRODUCED THROUGH A STOMACH PROBE AT 38 MG-KG DAILY FOR 1 MONTH INCREASED SERUM ALANINE AMINOTRANSFERASE AND ALK. PHOSPHATASE ACTIVITIES AND INCREASED THE RATIO OF LIVER WT. TO BRAIN WT. AT 7.6 MG-KG (ADDED TO THE FOOD) DAILY FOR 3 DAYS SEVIN INCREASED THE DURATION OF HEXOBARBITAL SLEEP AND SOMEWHAT INCREASED THE WT. RATIO OF LIVER TO BRAIN. SEVIN ADMINISTERED TO RABBITS AT 0.76 MG-KG AND TO RATS AT 0.38 MG-KG DAILY INHIBITED LIVER FUNCTION. REDUCED CHOLINESTERASE ACTIVITY AND CHANGES IN SERUM PROTEIN FRACTIONS WERE OBSD. WITH ALL DOSES. THE PESTICIDE INDUCED NECROTIC CHANGES IN THE LIVER. HITOCH. STUDIES SHOWED SHIFTS IN THE CONTENT AND DISTRIBUTION OF GLYCOGEN, IN LIVER SUCCINATE DEHYDROGENASE, AND IN CHOLINESTERASE OF THE BRAIN, SPINAL COLUMN, AND MOTOR NERVE ENDINGS OF THE STRIATED MUSCLES. SEVIN DID NOT ACCUMULATE IN THE BODIES OF RATS AND RABBITS. FACILITY: VSES. NAUCH. ISSLED. INST. GIG. TOKSIKOL. PESTITS., POLIM. PLAST. MASS, KIEV, USSR.

UNCLASSIFIED

UDC 613.63:632.95

USSR

KAGAN, YU. S., SASINOVICH, L. M. and OVSEYENKO, G. I.; Institute of the Hygiene and Toxicology of Pesticides, Polymers and Plastics

"Use of Correlation Analysis of Toxicity and Cumulation Indices to Establish Hygiene Standards for Pesticides in the Air of Working Areas (with Use of Computers)"

Moscow, Gigiyena Truda i Professional'nyye Zabolevaniya, No 8, 72, pp 21-25

Abstract: Attempts to derive a straightforward computational scheme to predict maximum possible concentrations (MPC) of new chemicals (pesticides, etc.) date back more than a dozen years, but the limited availability of toxicity data has prevented any significant success in this area. Known toxicity-index figures for thirty industrial chemicals were processed using computer techniques. Five regression equations, linking MPC with each toxicity index (LD_{50} , Lim_{chr} , Lim_{ac} , etc.), then were set up theoretical (calculated) and empirical MPC values were compared. In more than two-thirds of cases there was complete or approximate coincidence of the two values; in the remainder there was some degree of discrepancy, depending on the particular index used (notably in the case of DDT and PER-5 preparations). As a whole, the predictions were highly accurate. With judicious application and due allowance for physico-chemical anomalies in some cases, the system can be used to obtain reliable MPC

USSR

KAGAN, YU. S., et al., Gigiyena Truda i Professional'nyye Zaboлевaniya, No 8, 72, pp 21-25

values for any new chemical, thus eliminating lengthy and expensive experimental work. Computation is reduced to a minimum, since nomograms are used instead of equations.

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UDC 621.59 (088.8)

USSR

KAGANER, M.G., MIROLYUBSKAYA, YU. A.

"Method Of Application Of Vacuum--Multilayer Insulation"

USSR Author's Certificate No 298790, filed 8 May 68, published 14 May 71 (from RZh:Elektronika i yeye primeneniye, No 1, Jan 72, Abstract No 1A454P)

Translation: A method is proposed for application of vacuum--multilayer insulation on vessels of cylindrical form for storage of cryogenic liquids, by virtue of which strips of insulation are wound on the lateral face of the cylinder and insulating disks are applied at the bottom of the vessels. The method differs in the fact that with the object of increasing the productivity of labor and simplification of the installation of insulation for insulated bottoms, disks are used with a diameter larger than the diameter of the vessel, the protruding edges of which are cut into rectangular tongues and then turned back into the cylindrical part of the vessel and overlapped with respect to the perimeter of the insulation strips.

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1/2 010 UNCLASSIFIED PROCESSING DATE--27NOV70
TITLE--INDUSTRIAL EQUIPMENT FOR DRYING IN A FLUIDIZED BED -U-
AUTHOR-(02)-KAGANEVICH, YU.YA., ZLOBINSKIY, A.G. K
COUNTRY OF INFO--USSR
SOURCE--INDUSTRIAL EQUIPMENT FOR DRYING IN A FLUIDIZED BEDD
(PROMYSHLENNYYE USTANOVKI DLYA SUSHKI V KIPYASHCHEM SLOYE) LENINGRAD,
DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--DEHYDRATION, FLUIDIZED BED, DRYING OVEN, AUTOMATIC CONTROL
SYSTEM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--3003/1719

STEP NO--UR/0000/70/000/000/0001/0174

CIRC ACCESSION NO--AM0130579

UNCLASSIFIED

2/2 010

UNCLASSIFIED

PROCESSING DATE--27NOV70

CIRC ACCESSION NO--AM0130579

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT, TABLE OF CONTENTS: PREFACE 3.
CHAPTER I. GENERAL CHARACTERISTICS OF DRYING AND DEHYDRATION IN A
FLUIDIZED BED 5. II. INDUSTRIAL EQUIPMENT FOR DRYING AND DEHYDRATION
55. III. DESIGN AND CALCULATION OF FLUIDIZED BED DRIERS 107. IV.
DESIGN OF FLUIDIZED BED APPARATUS AND STANDARD CIRCUITS OF EQUIPMENT
144. V. AUTOMATIC CONTROL OF DRYING IN FLUIDIZED BED APPARATUS 163.
THE BOOK DEALS WITH CERTAIN RULES OF THE DRYING PROCESS IN A FLUIDIZED
BED. GIVEN ARE METHODS IN ENGINEERING CALCULATION AND FUNDAMENTAL
PRINCIPLES OF OPERATION AND DESIGN OF INDUSTRIAL EQUIPMENT FOR DRYING IN
A FLUIDIZED BED. THE BOOK WAS WRITTEN FOR ENGINEERS, TECHNICIANS AND
SCIENTISTS EMPLOYED BY THE CHEMICAL INDUSTRY AND RELATED INDUSTRIAL
BRANCHES, AS WELL AS INORGANIC CHEMISTRY STUDENTS.

UNCLASSIFIED

USSR

PLEKHOV, V. A., BERDASHKEVICH, N. A., BARYKIN, N. P., KAGANOV, A. A.

"Study of Plasticity and Deformation Resistance of EP303 Steel"

Tr. Ufim. Aviats. In-t. [Works of Ufim Aviation Institute], 1971, No 25, pp 127-134, (Translated from Referativnyy Zhurnal, Mekhanika, No 10, 1972, Abstract No 10 V1180 by R. A. Vasin).

Translation: Results are presented from standard tensile and upsetting tests of EP303 steel specimens in the 80-1,300° temperature range. The dependence of the basic characteristics of the steel on temperature and degree of deformation is presented in graphic form; the change in micro-structure of specimens at various temperatures is shown.

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1/2 030 UNCLASSIFIED PROCESSING DATE--02OCT70
TITLE--COATING STABLE IN NONFERROUS METAL MELTS -U-

AUTHOR--(03)--KAGANOV, I.R., SYCHEV, M.M., KOMLEV, V.G.

COUNTRY OF INFO--USSR

SOURCE--LITEINOE PROIZVOD. 1970, (1) 24

DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--METAL COATING, ZINC, LIQUID METAL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REFL/FRAME--1986/0129

STEP NO--UR/0123/70/000/001/0024/0024

CIRC ACCESSION NO--AP0102217

UNCLASSIFIED

2/2 030

UNCLASSIFIED

PROCESSING DATE--02JCT70

CIRC ACCESSION NO--AP0102217

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. COATINGS CHEM. STABLE AND NOT
WETTED BY MOLTEN ZN AND AL WERE BASED ON A MIXT. OF H SUB3 PO SUB4: H
SUB2 O: HYDRATED AL SUB2 O SUB3: :2.1:2.3:1 WHICH WAS BOILED FOR 7 TO
12 MIN (38 TO 44PERCENT H SUB2 O) THEN MIXED 1:1 WITH CR BORIDE AS
FILLER FOR CHEM. RESISTANCE AND COEFF. OF EXPANSION CONTROL. THE FE
SURFACE TO BE COATED WAS REOXIDIZED AT 900DEGREES, TO GIVE BETTER
ADHESION, THE THERMAL TREATMENT OF THE COATING BEING CONTROLLED TO GIVE
GOOD RESULTS.

UNCLASSIFIED

1/2 026 UNCLASSIFIED PROCESSING DATE--20NOV70
TITLE--CERAMIC ARTICLE OF INTRICATE DESIGN -U-
AUTHOR--(03)-KAGANOV, I.R., KOVALEVSKAYA, Z.V., YELIZAROV, N.I.
COUNTRY OF INFO--USSR
SOURCE--U.S.S.R. 257,453
REFERENCE--OTKRYTIYA, IZOBRETEL., PROM. OBRATZSY, TOVARNYE ZNAKI 1970,
DATE PUBLISHED-----70
SUBJECT AREAS--MATERIALS
TOPIC TAGS--CHEMICAL PATENT, GRAPHITE, SILICON CARBIDE, CERAMIC
TECHNOLOGY, CERAMIC ENGINEERING
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FNAME--3004/1778 STEP NO--UR/0482/70/000/000/0000/0000
CIRC ACCESSION NO--AA0132044
UNCLASSIFIED

2/2 C26

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AA0132044

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CERAMIC PRODUCTS OF COMPLEX CONFIGURATION WERE PRODUCED FROM COMPONENTS OF SILICIDIZED GRAPHITE BY CEMENTING THEM WITH A MIXT. OF SIC AND WATER GLASS IN A 1:1 RATIO. TO INSURE THE STABILITY OF THE PRODUCTS DURING PROLONGED CONTACT WITH NONFERRICUS METAL MELTS, THE CEMENTED PRODUCTS WERE COVERED WITH A COATING CONTG. FE FREE ZRSIO SUB4 AND AN ADDITIVE OF 0.5-10PERCENT H SUB3 SO SUB3 AND WERE FIRED AT GREATER THAN 300DEGREES. FACILITY: SCIENTIFIC RESEARCH DESIGN CONSTRUCTION INSTITUTE OF MACHINE BUILDING TECHNOLOGY.

UNCLASSIFIED

USER

UDO 621.382.5

VENBEROVSKIY, I.V., PABANOV, M.A., RIVLIN, A.S.

"Transient Processes In Thermoelectric Devices"

Sb. Tr. po agron. fiz. (Collection Of Works On Agricultural Physics), 1970, Typ 25, pp 70-85 (From REN--Elektronika i yeye primeneniye, No 6, June 1970, Abstract No 62266)

Translation: There is a solution in the paper of the problem of the temperature change at the cooled surface of a semiconductor thermoelement in a nonstationary regime. Formulas are obtained for calculation of the temperature and the effect is investigated of the thermal output of the surface of a thermopile and the thermal capacity of the mass attached to it on the course of thermoelectric cooling. 7 ill. 2 tab. 10 ref. Author's Abstract.

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Power Turbine, Engine, Pump

USSR

UDC: 621.362.1

KAGANOV, M. A., PRIVIN, M. R.

"Thermoelectric Heat Pumps. (Theoretical Principles of Calculation)"

Termoelektricheskiye teplovyye nasosy. (Teoreticheskiye osnovy rascheta) (cf. English above), Leningrad, "Energiya", 1970, 176 pp, ill. 44 k. (from RZh-Elektrotehnika i Energetika, No 7, Jul 70, Abstract No 7A178 K)

Translation: The authors consider the theoretical principles of thermal calculation of thermoelectric coolers and heaters which operate at a constant temperature of the junctions along the thermopile or at a variable temperature due to restricted flow of coolants. Solutions are given for the nonstationary state and conditions of stability. Methods are presented for efficiency optimization, as well as optimization with respect to calorific power and the expenditure of semiconductor materials. The book is written for engineers and scientific workers. A. Kh. Cherkasskiy.

USSR

UDC: None

IVANOVSKI, G. Y. and KAGANOV, M. I.

"Selective Transparence of Metallic Plates Caused by the Interaction of Electromagnetic and Sound Waves"

Leningrad, Fizika Tverdogo Tela, No 11, 1973, pp 3304-3311

Abstract: This theoretical paper computes the transmission coefficient of an electromagnetic wave through a metallic plate of given thickness, with the excitation of sound waves resulting from the incidence of the electromagnetic wave on the plate taken into account. While the resonance excitation of standing sound waves by an electromagnetic wave has been theoretically investigated (V. F. Kravchenko, ZhETF, 54, 1968, p 1494) for the case of a strong, constant magnetic field, where the basic transformation mechanism is inductive, the authors of the present paper consider the magnetic field to be absent, when the basic transformation mechanism is deformational. The case of mirror reflection of the electrons is considered under the assumption that the thickness of the plate is much greater than the mean free path of the electrons. The analysis begins with the system of equations describing the propagation

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USSR

UDC: None

IVANOVSKI, G. Y., et al, Fizika Tverdogo Tela, No 11, 1973, pp
3304-3311

of the electromagnetic and sound waves, consisting of the kinetic
equation for the electron distribution function, the Maxwell equations,
and the equation for oscillations of an elastic medium.

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USSR

UDC: None

KAGANOVA, I. M. and KAGANOV, M. I.

"Čerenkov Sound Radiation by a Particle Moving Through Metal"

Leningrad, Fizika Tverdogo Tela, No 7, 1973, pp 2119-2125

Abstract: This paper discusses the phenomenon in which a charged particle moving through a metal generates an electromagnetic field which brings conductivity electrons out of equilibrium and the electrons produce ions, with the transformation of electromagnetic waves into sound waves if the speed of the particles is greater than the speed of sound. In their analysis of this phenomenon, the authors limit themselves to considering an isotropic metal with an isotropic law of electron dispersion, and expressions are found for the longitudinal and transverse waves propagated in an isotropic body. It is found that the full intensity of the sound radiated at all frequencies is determined by the radiation of the longitudinal wave and that the spectral density of the transverse wave is essentially a function of the frequency. The authors note that the formulas obtained are interesting for analyzing the possibility of using charged particles as sources of ultrasonic waves.

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USSR

KOGANOVA, I. M., KAGANOV, M. I.

"Theory of Sound Generation by Charged Particles. Θ -Flash Sound Excitation"

Leningrad, Fizika Tverdogo Tela, Vol 15, No 5, 1973, pp 1536-1543

Abstract: A theoretical study was made of the characteristic mechanism of sound generation by charged particles resulting from the occurrence of a region of local heating around the fast particle track. The macroscopic theory of radiation of sound by a charged particle caused by thermoelastic dynamic stresses occurring near the track is constructed. The investigation is performed within the limits of a two-temperature model. The distribution of the emitted sound energy with respect to frequencies and the total radiation energy were calculated in two limiting cases: spherically symmetric and cylindrically symmetric temperature distribution.

A comparison of the results obtained with the intensity of Cerenkov sound emission [M. I. Kaganov, et al., ZhETF, No 31, 232, 1956] indicates that the radiation from the mechanism investigated here can constitute a noticeable portion of the total sound radiation by a charged particle. In some cases the Θ -flash radiation exceeds the Cerenkov radiation.

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KAGANOV, M. I.

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[List, Moscow, Vestnik Akademii Nauk SSSR, Russian, Vol 41, No 10, October 1971, pp 129-131]

Mathematical, Physical and Technical Sciences

I. M. Lifshits, M. Ya. Aspel', and M. I. Kaganov. Elektron-naya teoriya metallov (Electronic Theory of Metals). Moscow, 1971, 416 pages, 9000 copies, 1 r 89 k.

V. A. Makhonin. O psikhomorfizme v avtomatike (Psychomorphism in Automation). Institute of Problems of Information Transmission. Moscow, 1971, 128 pages, 5700 copies, 46 k.

Osvoyeniye kosmicheskogo prostranstva v SSSR. 1957-1967 [The Mastering of Cosmic Space in the USSR (1957-1967)]. Institute of

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